

Clinical Section

Compound Fractures, Gas Gangrene and Tetanus*

By

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Compound fractures differ from simple fractures anatomically by being in open communication with the outside air, and clinically by being potentially infected. In direct compound fractures the bone breaks at the site of the trauma, and the soft tissue wound and the fracture are at the same level. The soft tissues are lacerated and contused, thus reducing their vitality and resistance to infection, and dirt and infection may be ground into the wound, and often, into the fracture line. In indirect compound fractures, the fracture occurs at a distance from the site of the trauma, and becomes compound by the fragments piercing the skin from within outwards. The wound is in relatively healthy soft tissues whose resistance to infection approaches normal. Indirect compound fractures are usually less serious than direct ones, but they are all potentially infected, the infection being derived from the skin, clothing, ground, or other things with which the projecting fragment comes in contact. Injury severe enough to produce a compound fracture frequently produces considerable shock, and a variable amount of hemorrhage.

IMMEDIATE TREATMENT

In the treatment of a compound fracture there are three major problems to deal with; the treatment of the patient as an individual; the treatment of the soft tissue wound at the fracture site; and the treatment of the fracture. The treatment is divided into three stages; first aid, primary treatment in a hospital, and after care.

The first requirement in the first aid treatment is to make, or confirm, the diagnosis of a compound fracture. This is usually easy by inspection alone. There should be no manipulation or probing. If there is a soft tissue wound over a broken bone, it should be assumed that the fracture is compound, and treated as such, until proved otherwise.

Shock, if present, should be treated by keeping the patient recumbent, apply additional clothing, blankets, or external heat, administering morphine, and keeping the fracture immobilized.

The clothing over the wound should be cut away, or otherwise removed, and the wound covered with a sterile dressing saturated with alcohol. Hemorrhage is controlled by a compression dressing, or, if necessary, a tourniquet. If a tourniquet is applied it should not be drawn too tight, but just tight enough to control the brisk hemorrhage.

A little oozing does no harm but allows the tissues to retain their vitality, and thus increase their resistance to infection. No attempt should be made to reduce the fracture, clean the wound, or put anything into it. The old axiom "Splint 'em where they lie" applies even more to compound than to simple fractures. The fracture should be adequately splinted before the patient is moved. The patient should be transported in a recumbent position, preferably in an ambulance, to a hospital. It is usually better for the patient to wait a few minutes for an ambulance, than to be bundled into the backseat of a car, and rushed to the hospital.

At the hospital the patient's shock, if present, is treated immediately. If he has not had morphine he should be given a hypo at once, if conscious and in pain. He should be covered with warm blankets and surrounded with hot water bottles. If the shock is profound the patient is given intravenous saline. If there has been considerable hemorrhage, gum acacia, or a blood transfusion, is indicated.

An x-ray of the fracture should be taken to demonstrate to exact position of the fragments, and as a permanent record of the fracture before reduction was attempted.

When shock has been combatted, the patient is taken to the operating room and given an anaesthetic, either general or spinal. All surgical sterile precautions are taken.

If the part distal to the fracture is hopelessly mangled, or its blood supply is destroyed, amputation is done well above the fracture-site immediately. If the distal part is not deprived of its blood supply or hopelessly destroyed, attention is given to the wound and fracture.

A sterile dressing is placed over the wound and the skin for a wide area is scrubbed with green soap and sterile water. The hair is shaved away from the wound edges and washed off with more soap and water. Grease is removed with benzine or ether. When the surrounding skin is clean the sterile dressing is discarded. Gross contamination is picked out of the wound. The wound is then thoroughly washed with green soap and sterile water, after which both wound and the surrounding skin are washed with alcohol, dried with ether, and painted with tincture iodine. This is the general procedure used by most surgeons, but Bohler of Vienna, and Magnusson of Chicago, object to using soap and water on the skin or in the wound. Bohler merely paints the skin and wound with iodine, while Magnusson cleanses them with ether.

When the wound is clean it is debridged. The skin edge is grasp with forceps and a strip about 3 mm. wide is removed all around the wound with a scalpel or scissors. With fresh instruments all devitalized and contused tissue, with the exception of tendons, nerves, and large blood vessels,

* Paper read at Post-Graduate Course, Manitoba Medical College, February, 1938.

is removed. Soiled tendon and nerve sheathes are excised. All crushed and lacerated muscle in the wound is cut away until the muscle is red, bleeds on cutting, and contracts when pinched. Small detached boney fragments are removed, but large fragments, and those having some periosteal attachment are not removed. The soiled bone ends are rongueured or chiselled away to clean bone.

After the wound has been debridged, it is irrigated with saline solution, and treated with tincture of iodine or ether. Bohler and Magnusson condemn the irrigation of wounds stating that water or saline in the wound drives infection deeper into the tissues and thus does more harm than good. Caldwell, of Bellevue Hospital, New York, states that water or saline in the wounds does not carry in infection. He scrubs his wounds for 10 minutes by the clock, cleans them with alcohol, ether, and iodine, performs a debridement, and irrigates them with saline. The feeling here seems to be that the wound should be scrubbed with soap and water, and irrigated with saline, and that it does more good than harm.

It is generally agreed that the less foreign material, such as sutures, left in a wound, the better healing will be. Magnusson ligates bleeding vessels, but leaves severed tendons and nerves until the wound has completely healed, after which he cuts down and sutures them. Bohler sutures nerves but not tendons. McMaster, of Los Angeles County Hospital, and Ritter, of the New York Post-Graduate Hospital, suture both tendons and nerves if the wound is less than six hours old.

After the wound has been cleansed and debridged, the question of how to close it arises. Should it be closed tightly, closed with a drain left in, or left open? The answer is determined by the length of time which has elapsed since the injury, and the extent of the traumatized tissue. Small wounds less than six hours old may be closed tightly. Small wounds less than 10 hours old are closed loosely to allow for drainage. If the wound is large, or more than 10 hours old, it is left open. Dakin's tubes may be placed in the wound which is loosely packed with gauze; or the wound may be packed with vaseline gauze.

Many surgeons drain these wounds for the first forty-eight hours. Bohler advises drainage of large wounds by means of a drainage-tube, but recommends that the tube be placed through a fresh opening in healthy tissue.

Caldwell reviewed seventy-eight cases of compound fractures and presented some interesting figures. Of thirty-four compound fractures sutured without drainage, twenty-one per cent. became infected. Of twenty-five left open without drainage or packing twenty per cent. became infected. Of twelve left open and packed seventeen per cent. became infected. Of seven sutured and drained by means of a rubber tube forty-three per cent., or twice as many as those not drained by a tube, became infected. He came to the conclusion that a drainage tube acts as a foreign

body, increases the exudation, and prevents the tissues from exerting their strong defensive measures. He feels that, while all these wounds are contaminated, the tissues, if given a chance, will overcome what organisms remains after debridement; and that wounds should be either closed without drainage or left open and lightly packed with vaseline gauze.

Caldwell, Cotton, Speed and Wilson lay down a general rule that all indirect compound fracture wounds, no matter how small, should be opened, thoroughly cleansed, and debridged. This rule is not strictly followed here. If the wound is small, and not grossly contaminated it is painted with iodine and covered with a dry sterile dressing. In the majority of cases no infection develops.

When the wound has been attended to the fracture is reduced, usually by manual traction on the lower fragment. If the fracture cannot be reduced by manual traction, due to over-riding of the fragments, skeletal traction may be used, the Kirschner wire or Stinsman pin being placed through the bone some distance from the fracture.

Hey Groves and Bohler severely condemn plating compound fractures through the wound; Wilson and Cochran, Caldwell and Speed, condone plating in rare instances; while Forrester, of Sherman's clinic, recommends the procedure. He plated 146 of 304 compound fractures without any cases of serious infection, and obtained fewer persistent sinuses than in the cases not plated. The plate is removed in 4-6 weeks when union is sufficient to hold the fragments in place.

When the fracture has been reduced the part is immobilized in a cast, on a splint, or by traction. If a cast is applied a window is cut over the wound, and the wound dressed through this opening. Bohler advises that closed wounds be left exposed to the air without any dressing. Healing occurs under the scab which forms. Casts are more comfortable than traction and immobilize the fracture and wound better.

Caldwell reports a series of 84 compound fractures in which 21 were treated by traction, and 63 were put up in casts. Of the 21 with traction three developed non-union. Of the 63 put up in casts only one non-union resulted.

A prophylactic dose of antitetanic serum should be given to every case of compound fracture. If there has been much laceration of tissue, or interference with the blood supply, a prophylactic dose of gas gangrene antitoxin should also be given.

After excision of a wound a marked febrile reaction often occurs. If there is no local redness, tenderness, heat, or swelling, around the wound; and no enlargement of the regional lymph glands, the wound is left alone, or one or two sutures removed. If infection does occur in the wound, the wound is opened sufficiently to provide free drainage.

In the five-year period from 1933 to 1937 there have been 84 compound fractures treated here in

the General Hospital. Eighty of these involved one or more of the bones of the limbs, three of the others involved the jaws, and one the skull. There were nine deaths, three from gas gangrene, and six, not from their compound fractures, but from shock and hemorrhage incidental to their severe injuries. There were no cases of tetanus. Shock, when present, was treated by morphine, external heat, intravenous saline, and blood transfusions.

Twenty were given antitetanic serum, and nine both antitetanic serum and gas gangrene antitoxin. All the wounds were cleansed in some manner, usually with soap and water. Forty-three had complete debridement, and thirteen required amputation. There were thirty-eight closed reductions; seventy-three per cent. healed, two developed osteomyelitis, one non-union, and seven gas gangrene. Of eight primary open reductions seventy-five per cent. healed, one developed non-union and one left the hospital with persistent drainage. Metal plates were applied through the wound in six cases; five, or eighty-three per cent. healed, and one developed osteomyelitis and non-union. Of five open reductions with internal fixation performed nine days or more after the fracture, all healed.

GAS GANGRENE

Ten, or eleven per cent., of the eighty-four compound fractures studied in this group developed gas gangrene. During the same five-year period there were ten additional cases of gas gangrene, not connected with compound fractures, making twenty in all. Of the cases not connected with compound fractures four followed injuries to the soft tissues, one followed drainage of an appendical abscess, one drainage of an empyema, one a self induced abortion, one an ischiorectal abscess, one a piece of steel in the eye, and one a *B. Welchii* septicemia originating in the gall bladder.

In thirteen of these cases smears and cultures were taken and all showed *B. Welchii*. While *B. Welchii* is the most frequent offender, it is by no means the only anaerobe that causes gas gangrene. Ghormley, of Rochester, lists ten anaerobes found in gas gangrene; Bates, of Iowa City, states that *B. Welchii* is responsible for eighty per cent. of gas gangrene; *Vibrio septique* ten per cent. and *B. Oedematiens* three per cent. The other seven per cent. is made up of rarer anaerobes such as *B. Sporogenes*, *histolyticus*, and *fallax*. Several of these anaerobes may be present in one wound. In giving gas gangrene antitoxin one should use a polyvalent antitoxin effective at least against *B. Welchii*, *Vibrio septique*, *B. Sporogenes*, *Oedematiens* and *histolytica*.

The anaerobes of gas gangrene occur normally in the intestine of animals and man. They are widely prevalent in soil. Before leaving the intestine these organisms form spores which are very resistant to unfavorable environment, and unaffected by the oxygen of the air. Spores occur in substances other than soil, such as shot-gun shell wads and wool.

When these anaerobes enter a wound they may or may not cause gas gangrene. In an American hospital during the war 890 wounds were cultered; fifty-three per cent. showed anaerobic bacilli, but only one-third of these developed gas gangrene. The anaerobes are relatively non-pathogenic. They are incapable of producing gas gangrene by their presence alone. They must be accompanied by failure of circulation or extensive cellular damage to large quantities of muscle. Gas gangrene is essentially a disease of devitalized tissues. Besides traumatic injuries, gas gangrene sometimes follows amputation for obliterative vascular disease such as diabetic gangrene, arteriosclerosis obliterans, and Burger's disease.

The incubation period of gas gangrene is from two hours to four days.

The early symptoms of gas gangrene are severe pain in the region of the wound, a firm induration about the wound, and elevation of the pulse-rate out of proportion to the elevated temperature. Ghormley stresses the unduly elevated pulse-rate as a strongly suggestive, although not pathognomonic, early sign of gas gangrene. If we accept the rule that the pulse-rate is elevated ten beats for each degree of elevated temperature, then the twenty cases here reported all showed an unduly elevated pulse-rate.

Late signs are discoloration of the skin, a brownish discharge, crepitation in the tissues, gas escaping from the wound or seen on the x-ray films, and a foul odor. Smears and cultures confirm the diagnosis. Some cases of gas gangrene have no odor. Crepitation occurs in interstitial emphysema, and air bubbles in the tissues are not infrequently seen on the x-ray films of compound fractures.

The treatment of gas gangrene is by gas gangrene antitoxin, surgery, and dressings.

Gas gangrene antitoxin should be administered as soon as gas gangrene is suspected. Ten to 20,000 units should be given intravenously, followed by from four to 10,000 units intramuscularly in two hours. The intramuscular injections are repeated daily until the gas gangrene infection subsides. Ghormley in a study of thirty-three cases found that an average of two doses was sufficient, and that those patients who reacted favorably did so after the first injection.

Surgery in gas gangrene consists of opening the wounds widely to promote drainage and to leave them in contact with the air; and amputations. The decision as to the necessity of amputation must rest with the surgeon in the individual case. If amputation is performed it should be of the guillotine type and left open. No sutures are left in the wound except those to tie off blood vessels. The wound is left exposed to the air. Oxygen in a concentration of 3.5% of that in the air is bactericidal to gas gangrene organisms. In our series of 14 cases following injuries to the extremities there were nine amputations. Eight of the nine lived and one died. Of the five without amputation three lived and two died.

Oxidizing agents, such as Dakin's solution, potassium permanganate, and hydrogen peroxide, are used in the dressing of the wound. Carrel Dakin's tubes are frequently placed in the wound and the wound irrigated with Dakin's solution every hour. Dakin's compresses or irrigation without Carrel Dakin's tubes may also be used. Potassium permanganate 1:1000 to 1:8000, or hydrogen peroxide full strength, may be used as an irrigation or a compress. In our series Dakin's solution was used nine times as often as potassium permanganate or hydrogen peroxide.

Ten years ago Kelly, of Omaha, treated a practically moribund case of gas gangrene with x-ray therapy. The response was dramatic and the patient recovered. In the next three years he treated eight cases with x-ray. Six of the cases involved the limbs and they all recovered. Two involved the trunk and both died. In 1936 Kelly collected fifty-six cases treated by x-ray. Fifty-one were living and five were dead. (He does not include his first two trunk cases because they were inadequately treated with x-ray). All the rest of the trunk cases recovered. Of forty-four extremity cases, fifteen had amputation, and five of these died. The other twenty-nine without amputation all recovered. Kelly feels that amputation is not a therapeutic measure in gas gangrene. He recommends gas gangrene antitoxin, local surgical measures, and antiseptics, but condemns amputation before the gas gangrene has subsided. The x-ray treatment is started as soon as the diagnosis is made, and given morning and evening for at least three days.

No cases of gas gangrene have been treated with x-ray in the General Hospital. One case in another hospital had two x-ray treatments twenty-four hours apart. This patient recovered, but probably not due to the x-ray treatments, since the dose was inadequate, and a study of the chart revealed no change in the patient's pulse-rate, temperature, or general condition immediately followed the x-ray treatments.

SULPHONILAMIDE

The latest treatment for gas gangrene is sulphonilamide in large doses by mouth. Bohlman, of Johns Hopkins, reported three cases of compound fracture complicated by gas gangrene treated with sulphonilamide. All three recovered. Smears and cultures from all three cases showed *B. Welchii*. In the first two cases there was free drainage of the wound but no debridement or amputation. Both cases cleared up their gas gangrene but developed a low grade osteomyelitis which later healed. The third case had primary amputation of the leg because of a severe crushing injury and developed gas gangrene in the stump. The wound was layed open, and the patient given sulphonilamide by mouth. He recovered without osteomyelitis.

The mode of action of sulphonilamide is not known but it does seem to be effective in gas gangrene infection. Its curative effect is exerted by maintaining a high concentration in the blood

and tissues for several days. Adequate concentration can be as quickly obtained by oral administration as by injections. A large single initial dose should be given, and then the daily dose divided into four to six hour periods in order to maintain as nearly uniform concentration in the blood and tissues as possible. The dose should be rapidly decreased following prompt improvement.

In Bohlman's first case he gave 15 grs. OH 6 for two days, 10 grs. OH 6 for five days, and 5 grs. OH 3 for an additional two days.

His second case received 25 grs. as an initial dose, 75 grs. in divided doses the second day, 30 the third, and 45 the fourth, after which sulphonilamide was discontinued.

The third case received 20 grs. OH 4 until 60 grs. were taken the first day, 85 the second, 65 the third, 40 the fourth, 60 the fifth, and forty the sixth, after which sulphonilamide was discontinued. Marked clinical improvement was noted in all three cases within twenty-four hours after sulphonilamide was instituted. Bohlman advises that sensible conservative principles be combined with the use of sulphonilamide, by which I presume he means free drainage, exposure to air, and oxidizing antiseptics, since he doubts the value of gas gangrene antitoxin either as a prophylactic or a therapeutic measure.

One case of gas gangrene, that following open drainage of an empyema, was treated in the General Hospital with sulphonilamide, but in doses much smaller than that advised by Bohlman. The maximum daily dose was 30 grains of sulphonilamide and three ampules of prontosil. The patient died on the fourth day after sulphonilamide treatment was instituted.

A study of the mortality rates in series of cases treated by different methods seems to indicate that x-ray and sulphonilamide therapy is superior to the conventional treatment of gas gangrene.

The mortality rate in the American army during the war was 48.5%. In the American Surgeon-General's report for 1929 the mortality was 53%. Milles, in 1932, reported 607 cases in civil practice with a mortality of 47.2%. Ghormley, in 1933, reported 33 cases with a mortality of 42.5%. Of the 20 cases treated in the General Hospital in the last five years, the mortality was 40%. The treatment in this series consisted of serum, surgery, and antiseptic dressings.

In Kelly's series of fifty-six cases treated with x-ray, the mortality was 8.9%.

In Bohlman's three cases treated with large doses of sulphonilamide, the mortality rate was nil.

TETANUS

Although none of the compound fractures developed tetanus, there were three cases treated at the General Hospital during the same five-year period. One followed a sliver in the palm of the hand, one a puncture wound in the thigh when the patient fell on a picket fence, and one followed diathermy to a rodent ulcer.

Unlike gas gangrene, tetanus is caused by only one organism, the tetanus bacillus. The tetanus bacillus is a normal inhabitant of the intestine of animals. Before the bacilli leave the intestine they form spores which are very resistant to unfavorable conditions. They resist boiling for five minutes, five per cent. phenol for 15 hours, and drying for 10 years. They are, however, destroyed by 1% silver nitrate in one minute. The bacilli are wide spread in street dirt, and enter the body through a wound contaminated with dust or soil. The incubation period is from three to thirty days or longer. The longer the incubation period the greater the likelihood of recovery. During the incubation period the wound may heal or suppurate, according to associated contamination.

The bacilli remain at the site of the wound and elaborate a toxin. The toxin affects the muscles in the region of the wound directly, and then spreads to the nervous system. It has been taught since 1903 that the toxin travels up the motor nerve to the spinal cord. Abel, in 1935, injected tetanus toxin into axon cylinders and perineural sheaths of motor nerves but failed to produce any symptoms of tetanus. When he injected large amounts of tetanus toxin into a muscle deprived of all nerve supply he produced tetanus in that muscle and other muscle groups. When he injected larger amounts of tetanus toxin intravenously he produced a generalized tetanus. He concluded that the toxin does not travel up the motor nerves, but is absorbed into the lymphatic and blood system, and thus reaches the central nervous system, where it exerts its action on the motor cells.

The early signs of tetanus are muscular rigidity, painful cramps, or spasmodic twitchings in the region of the wound. These are followed by difficulty in opening the mouth, increased rigidity of the facial muscles, spastic smile (risus sardonius), difficulty in protruding the tongue, and increased reflexes.

The late signs are generalized tetanic spasms holding the body rigidly straight, hyper-extended, or occasionally flexed. These spasms are excited by slight external irritations and subside slowly.

There may be apyrexia, or pyrexia. The temperature usually rises to 109° or 110° shortly before death.

The treatment of tetanus begins with prophylaxis, which consists of thoroughly cleaning punctured or lacerated wounds and disinfecting them with 1% silver nitrate or tincture of iodine, and the administration of a prophylactic dose of antitetanic serum.

When tetanus has developed, the treatment consists of careful nursing, antitetanic serum in therapeutic doses and sedatives.

The patient should be isolated, protected from noise, movements, and other disturbances. The diet should be fluid, by mouth if the patient can swallow, or by nasal tube passed when the patient is under an anaesthetic, if he cannot swallow.

The antitetanic serum should be given in large doses intravenously, intraspinally, and intramuscularly. Babcock states that during the war no case of tetanus recovered when the serum was administered by the intravenous route alone. He recommends 30,000 units intravenously, 20,000 units intraspinally, and 10,000 units intramuscularly every 24 hours for three days. If the response is prompt the injections are omitted after the third day. In giving the intraspinal serum, the patient is placed under an anaesthetic. An equal volume of cerebrospinal fluid is withdrawn before the serum is injected. The intramuscular injection is given four to eight hours after the intraspinal or intravenous administration.

In the three cases here reported the three routes were used. The first case had 57,500 units intravenously, 12,500 units intraspinally, and 5,000 units intramuscularly, over a period of six days. The second case had 140,000 units intravenously, 50,000 units intraspinally, and 70,000 units intramuscularly, over a period of seven days. The third case had 25,000 units intravenously, 30,000 units intraspinally, and 85,000 units intramuscularly, over a period of thirteen days. The largest single combined dose in any one day was 70,000 units. These three patients recovered. When recovery occurs in tetanus, it is usually complete.

The sedatives recommended in tetanus are chloral, bromides, or sodium luminal. Sometimes morphine is necessary. These sedatives can be given by mouth if the patient is able to swallow, or by rectum or hypo if the patient is unable to swallow.

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The Manitoba Medical Association Review

Formerly the Bulletin of the Manitoba Medical Association

ESTABLISHED 1921

WINNIPEG, NOVEMBER, 1938

Published Monthly by the
MANITOBA MEDICAL ASSOCIATION
Editorial Office
102 MEDICAL ARTS BUILDING, WINNIPEG

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Business Manager

J. GORDON WHITLEY

Annual Subscription - \$2.00

*Editorial or other opinion expressed in this Review is not necessarily
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Annual Meeting

The 1938 Annual Meeting was the largest yet held by the Manitoba Medical Association, as there were over three hundred registrations.

Reports of the various Committees were published in the October number of the Manitoba Medical Association "Review," and the minutes of the annual general meeting appear in the current number.

One of the features of the meeting was the large number of visitors from outside of Manitoba. Medical men were present from western Ontario, Saskatchewan, Alberta, and also the neighbouring states of North Dakota and Minnesota.

Hospital Cases from Saskatchewan

Cases have been reported in which patients have been sent in to Manitoba Hospitals from Municipalities in Saskatchewan where the patient is unable to pay for medical attention and no arrangements are made by the Municipality for payment.

It is suggested that in such instances the doctor attending the patient should notify the Municipality concerned within fifteen days of the time the patient is admitted to hospital, and request that arrangements be made for payment of the account on the basis of 50 per cent. of the regular schedule of fees.

Such procedure, of course, is not necessary in case of patients who are paying their own private accounts.

Membership in Canadian Medical Association

There has been some decline in the number of medical men in Manitoba who are members of the Canadian Medical Association. As the membership year begins from January 1st, it is suggested that as many as possible of the medical practitioners in Manitoba should arrange to join the Canadian Medical Association in 1939.

Anyone who attended the Annual Meeting of the Manitoba Medical Association must realize that a great deal of the success of this meeting was due to the assistance of the Canadian Medical Association in providing three speakers for the meeting. The President of the Canadian Medical Association, Professor K. A. MacKenzie, attended the meeting and took an active interest in the affairs of the Annual General Meeting and also read two clinical papers at the scientific sessions. Dr. T. C. Routley, General Secretary of the Canadian Medical Association, was also present and gave valuable assistance and took part in the discussion of the affairs of the Association and the work of various Committees.

The contributions of Professor A. T. Bazin and Professor L. H. Newburgh to the scientific programme were of outstanding importance. In addition, the Canadian Medical Association arranged for these two speakers to address a public meeting. The Concert Hall of the Winnipeg Auditorium, which holds eight hundred, was filled to capacity and some people were unable to obtain admission.

These tangible signs of the assistance of the Canadian Medical Association to our Provincial Association should make every medical man in Manitoba realize that it is his duty, if at all possible, to become a member of the Canadian Medical Association. The strength of any voluntary medical organization depends entirely upon the support given to it by the members of the profession. There are many problems in medicine which can be dealt with only by a national organization and therefore it is in the interests of every individual practitioner to see that the Canadian Medical Association has his continued support. The membership fee is only ten dollars and this includes subscription to the excellent journal, which is published monthly, and the opportunity to attend the Annual Meeting of the Canadian Medical Association.

Applications for membership should be sent to the Secretary of the Canadian Medical Association, 184 College Street, Toronto 2, Ontario, with a money order or cheque for ten dollars.

Medical Research

It is requested that any members from the medical profession of Manitoba who are carrying on research work apart from the larger hospitals or the University, should send their names to the Secretary of the Manitoba Medical Association.

This information has been requested by the Associate Committee on Medical Research of the National Research Council of Canada.

Post-Graduate Course in Paediatrics

The Faculty of Medicine announces a course in Paediatrics for practitioners from outside of Winnipeg, to be given during the latter part of February. The following is a tentative programme of this course. Further details and dates will be announced later.

The visiting clinician at the Post-Graduate Course in Paediatrics at the Winnipeg Children's Hospital in February will be Dr. Joseph Brennemann. Doctor Brennemann is Professor of Paediatrics at the University of Chicago. He is Editor of Brennemann's Loose Leaf System of Paediatrics. Dr. Brennemann is a man of encyclopaedic knowledge, a physician of vast clinical experience both in private and hospital practice, and one who holds that common sense is the first requisite in the practice of medicine.

Tentative Programme for Post-Graduate Course

First Day

- 9.00-10.00 a.m.—Registration at Medical College.
 10.00-10.15 Welcome by Dean of Medical College.
 10.15-11.00 Address by Dr. Joseph Brennemann. Subject to be announced.
 11.00-12.00 Ward Clinic, Winnipeg General Hospital.
 12.30- 1.30 p.m.—Lunch at Winnipeg General Hospital.
 2.00- 3.00 Treatment of the Pareses and Paralysis following Poliomyelitis.* Dr. A. E. Deacon.
 3.00- 4.00 On some blood diseases in infancy, including simple anaemia. Dr. B. Chown.
 8.15 p.m.—Address to Winnipeg Medical Society by Dr. Brennemann.

Second Day

- 9.00-11.00 a.m.—Chronic Cough in children. A group composium. Dr. Gordon Chown, Dr. F. A. MacNeil, Dr. M. B. Perrin and members of staff.
 11.00-11.30 On Squint* Dr. J. McGillivray, Dr. I. H. Backman, Dr. F. A. McNeil. Eye Department.
 11.30-12.00 X-ray interpretation in infants and young children.* Dr. E. Patriarche.
 12.00- 2.00 p.m.—Luncheon at Children's Hospital.
 2.00- 2.45 Treatment of diabetes in children.* Dr. H. Medovy.
 2.45- 3.45 Endocrine diseases. Dr. G. H. Shapera.

Third Day

- 9.00-10.00 a.m.—Treatment of empyema. Dr. J. D. McEachern.
 10.00-11.00 Infantile eczema. Dr. A. Birt.
 11.00-12.00 Some classical feeding difficulties. Dr. O. J. Day.
 12.00- 1.00 p.m.—Luncheon at St. Boniface Hospital.
 1.00- 2.00 Treatment of gonococcal vaginitis in infants and children. Dr. J. Crawford.
 2.00- 3.00 Treatment of infantile diarrhoea. Dr. H. E. Popham.
 3.00- 4.00

* Continuous demonstrations will be set up in these subjects.

Minutes of Executive Meeting

Minutes of a Meeting of the Executive of the Manitoba Medical Association held at the Fort Garry Hotel, Winnipeg, Wednesday, September 21st, 1938, at 7.00 p.m.

Members of the Executive:

Dr. C. W. Burns (Chairman)	Dr. W. G. Campbell
Dr. Geo. Clingan	Dr. W. W. Musgrove
Dr. E. L. Ross	Dr. W. F. O'Neill
Dr. Digby Wheeler	Dr. E. K. Cunningham
Dr. C. W. MacCharles	Dr. E. W. Stewart
Dr. S. G. Herbert	Dr. H. O. McDiarmid
Dr. W. S. Peters	Dr. E. S. Moorhead
Dr. A. S. Kobrinsky	Dr. O. C. Trainor
	Dr. J. R. Martin.

Guests:

Dr. A. T. Mathers	Dr. Ross Mitchell
Dr. C. R. Gilmour	Dr. F. W. Jackson
Dr. G. S. Fahrni	Dr. F. D. McKenty.

The above gentlemen on this occasion were the dinner guests of the President, Dr. C. W. Burns.

Following dinner, short addresses were made by Dr. J. D. Adamson, Dr. H. O. McDiarmid and Dr. G. S. Fahrni.

It was duly moved, seconded and passed: THAT the minutes of the last Executive meeting held on August 31st, 1938, be taken as read.

Letter of Thanks to the College of Physicians and Surgeons.

It was duly moved, seconded and passed: THAT a letter of thanks be sent to the College of Physicians and Surgeons for their generous grant for carrying on the work of the Extra-Mural Committee.

Appointment of Nominating Committee.

The President appointed a Nominating Committee consisting of the three following: Dr. Geo. Clingan, Dr. Ross Mitchell and Dr. F. G. McGuinness.

Membership Report.

Dr. Wheeler reported that there had been an increase in membership over the last year.

Treasurer's Report.

The Treasurer, Dr. Wheeler, read the report and explained the details.

It was moved by Dr. D. Wheeler, seconded by Dr. E. W. Stewart: THAT this report be adopted. —Carried.

Report of the Executive Committee.

The report of the Executive Committee as printed was summarized by the Secretary, Dr. C. W. MacCharles.

It was moved by Dr. C. W. MacCharles, seconded by Dr. W. G. Campbell: THAT this report be adopted. —Carried.

Saskatchewan Hospital Cases.

The Secretary reviewed this question including a letter received from Dr. O. S. Waugh, in which he stated that the suggestions made by the Secretary of the Saskatchewan Medical Association were satisfactory to him.

It was suggested that the doctors should be advised that it is the responsibility of each individual practitioner to protect his own interests by communicating with the Municipality concerned in each particular case.

It was suggested further that a notice to this effect should be published in the *Manitoba Medical Association Review*.

It was moved by Dr. E. S. Moorhead, seconded by Dr. E. W. Stewart: THAT this procedure should be adopted. —Carried.

Medical Research Council.

The Medical Research Committee of the National Research Council of Canada correspondence was reviewed by the Secretary.

It was moved by Dr. O. C. Trainor, seconded by Dr. A. S. Kobrinsky: THAT the members of the Association be asked at the Annual Meeting for information with regard to any members carrying on research. —Carried.

Resolutions Committee.

The Chairman of the Resolutions Committee, Dr. W. S. Peters, reported on resolutions which had been prepared by the Committee. These were approved by the Executive Committee.

Entertainment Allowance.

It was moved by Dr. W. W. Musgrove, seconded by Dr. A. S. Kobrinsky: THAT the Executive Committee recommend to the Association that an entertainment allowance be granted to the President each year.

This motion was not carried.

Permanent Record of Presidency.

It was suggested that the incoming Executive consider the possibility of instituting some permanent record for each individual who has served a term as President of the Association. It was suggested that a chain of office with the names of the various Presidents engraved might be suitable.

Report of Federation Committee.

The Chairman, Dr. F. D. McKenty, discussed the details of the report. The President suggested that as the vote on the report of the Committee on Federation at the last meeting of the Executive had been fairly closely divided, that it might be advisable to have another vote on this report.

It was moved by Dr. Digby Wheeler, seconded by Dr. W. W. Musgrove: THAT the Executive Committee of the Manitoba Medical Association recommend to the Annual Meeting of the Association that no application be submitted at present for admission as a division of the Canadian Medical Association. —Carried.

A standing vote was taken: for the motion 11, contrary 2.

Correspondence.

Canadian Industries Limited:

It was moved by Dr. D. Wheeler, seconded by Dr. H. O. McDiarmid: THAT this correspondence be filed. —Carried.

Report of Nominating Committee.

The report of the Nominating Committee was presented, and it was moved by Dr. Geo. Clingan, seconded by Dr. O. C. Trainor: THAT this report be adopted.

During the discussion it was pointed out by the Secretary that only one name had been submitted for the office of Honorary Secretary, and that according to Article XI of the Constitution all officers shall be elected from names of at least two members for each office.

The President instructed the members of the Committee to retire and bring in two names for the office of Secretary.

The amended list of names was then presented, and the report as amended, adopted.

Annual Meeting, 1938

Minutes of the Annual Meeting of the Manitoba Medical Association held in the Fort Garry Hotel, Thursday, September 22nd, 1938, at 7.30 p.m.

Attendance at meeting, 125 members.

Those at the head table, including officers and guests, were as follows:

Professor K. A. MacKenzie, Halifax
Dr. C. C. Ross, Ottawa
Dr. T. C. Routley, Toronto
Dr. C. W. Burns, Winnipeg
Dr. Digby Wheeler, Winnipeg
Dr. E. L. Ross, Ninette
Dr. S. G. Herbert, Winnipeg.
Dr. C. W. MacCharles, Winnipeg.

Following dinner, the President called the meeting to order and introduced Professor K. A. MacKenzie, President of the Canadian Medical Association, who addressed the meeting briefly.

Following the remarks of Professor MacKenzie, the President introduced Dr. T. C. Routley of Toronto and Dr. C. C. Ross, Secretary of the Canadian Society for the Control of Cancer.

Dr. C. C. Ross gave a short address.

The President then requested the Secretary to read the minutes of the last Annual Meeting.

It was moved by Dr. C. W. MacCharles, seconded by Dr. J. S. McInnes: THAT as the minutes of the last annual meeting had been published in the *Review*, they be adopted. —Carried.

Report of Nominating Committee.

Dr. Geo. Clingan, Chairman of the Nominating Committee, then presented the report of his Committee:

President.....	{ Dr. W. S. Peters, Brandon { Dr. E. L. Ross, Ninette
1st Vice-President.....	{ Dr. W. E. Campbell, Winnipeg { Dr. S. G. Herbert, Winnipeg
2nd Vice-President.....	{ Dr. E. K. Cunningham, Carman { Dr. C. B. Stewart, Winnipeg
Secretary.....	{ Dr. C. W. MacCharles, Winnipeg { Dr. Geo. Clingan, Virden
Treasurer.....	{ Dr. C. E. Corrigan { Dr. Earl Stewart
Rural Members at Large	{ Dr. W. G. Riddell, Beausejour { Dr. E. J. Skafel, Minnedosa
Winnipeg Members at Large	{ Dr. Geo. Brock, Winnipeg { Dr. J. N. B. Crawford, Winnipeg

It was moved by Dr. Geo. Clingan, seconded by Dr. F. G. McGuinness: THAT this report be adopted.

Dr. E. L. Ross asked leave to withdraw his name. He stated that he hoped the Nominating Committee would accept this suggestion and allow Dr. Peters' name to stand in order that his election might be made unanimous.

The President then called for further nominations from the floor for the office of President.

It was moved by Dr. J. S. McInnes, seconded by Dr. E. L. Ross: THAT nominations for the office of President be closed. —Carried.

The Chairman then declared Dr. W. S. Peters, of Brandon, elected as President.

Dr. Peters addressed the meeting and thanked Dr. Ross for his kindly remarks, and the Association for the honor they had done him.

Dr. Clingan stated that in view of Dr. Peters' appointment to the Presidency, he would like to nominate Dr. E. L. Ross to replace Dr. Peters as a rural member at large on the Executive for the unexpired term.

It was moved by Dr. Geo. Clingan, seconded by Dr. Ross Mitchell: THAT Dr. E. L. Ross of Ninette replace Dr. W. S. Peters as a member at large on the Executive for the unexpired term.

—Carried.

It was moved by Dr. C. M. Strong, seconded by Dr. W. E. McElmoyle: THAT nominations for the whole list of officers be closed. —Carried.

Presidential Address.

The Vice-President, Dr. E. L. Ross, then took the chair and called upon Dr. C. W. Burns for the Presidential address.

Following the Presidential address, Dr. Ross spoke on behalf of the Executive and the whole Association and thanked Dr. Burns for his excellent address.

Appointment of Scrutineers.

The President then appointed Dr. E. H. Alexander and Dr. W. W. Musgrove as scrutineers,

and ballots were passed for the election of officers on the Executive.

Committee Reports.

The reports of the various Committees had been printed in pamphlet form and distributed to all the members present. With the exception of the Report on Federation, the adoption of these reports was duly moved by the respective chairmen and seconded, and in each case the motion was carried.

The Committee reports were published in the October number of the *Review*.

Report of Committee on Federation.

The President requested Dr. F. D. McKenty to further explain the report of his Committee to the meeting. Dr. McKenty replied that the report of the Committee as printed with the other Committee reports was only the conclusions of a complete report submitted at the Halifax meeting of the Canadian Medical Association in June, and that this report should be taken and read as a continuation of the previous report.

The complete report on Federation having been printed in pamphlet form was passed among the members present, and was reviewed in detail by Dr. McKenty.

The first report of the Committee on Federation was published in the July number, and the second report in the October number of the *Review*. The final paragraph of the second report was as follows:

"Your Committee is therefore reluctantly forced to recommend that the Manitoba Medical Association do not submit at present any application for admission as a Division of the Canadian Medical Association."

It was moved by Dr. F. D. McKenty, seconded by Dr. C. M. Strong: THAT this report be adopted.

Following Dr. McKenty's remarks, Dr. Routley addressed the meeting and discussed the various clauses, objections and recommendations contained in this report, and the consideration that was given it when presented at the Halifax meeting of the Canadian Medical Association. He stated that he hoped that the Manitoba Medical Association would enter Federation, and that any amendments to the constitution which they might consider advisable, could be suggested after federating.

Professor MacKenzie addressed the meeting and stated that criticisms as made by Manitoba was a good thing, but that the question of federation had been discussed in Ontario for two or three years before entering into it. He felt that should there be any changes necessary that revision could be made after the Manitoba Medical Association had become a Division.

Dr. Thorlakson spoke in favor of joining Federation now, and moved that an amendment be made instructing the incoming Executive to make application to the Canadian Medical Association for membership and federation. This amendment was seconded by Dr. Ross Mitchell.

Discussion followed by Drs. Ross Mitchell, H.

McDiarmid and A. F. Menzies, who urged against adoption of the report.

Dr. O. C. Trainor then addressed the meeting and spoke against joining Federation at the present time, and stated that he did not consider the present constitution suitable. Dr. Trainor was of the opinion that it would be better to attempt to have the Constitution amended before joining federation rather than to attempt to have it corrected afterwards.

Dr. McKenty further reviewed the report.

The President then ruled that Dr. Thorlakson's amendment was out of order, and called for a standing vote: for the motion 57, against 22. Dr. Burns therefore declared this report adopted.

Report of Scrutineers.

—Carried.

The scrutineers then reported on the checking of the ballots, and the President declared the following elected officers and members of the Association for the ensuing year:

President.....	Dr. W. S. Peters, Brandon
First Vice-President.....	Dr. W. E. Campbell, Winnipeg
Second Vice-President.....	Dr. C. B. Stewart, Winnipeg
Honorary Secretary.....	Dr. C. W. MacCharles, Winnipeg
Honorary Treasurer.....	Dr. C. E. Corrigan, Winnipeg
Rural Member.....	Dr. E. J. Skafel, Minnedosa
Winnipeg Member.....	Dr. Geo. Brock, Winnipeg

Report of Resolutions Committee.

Seven resolutions were introduced recording the thanks of the Association to the Ladies' Committee, Fort Garry Hotel, Press of the City of Winnipeg, St. Charles Country Club, St. Boniface Hospital, Winnipeg General Hospital, and to the Canadian Medical Association, Professor A. T. Bazin, Professor L. H. Newburgh and Professor K. A. McKenzie.

It was moved by Dr. W. S. Peters, seconded by Dr. S. G. Herbert: THAT these resolutions be adopted.

—Carried.

Correspondence with Regard to Workmen's Compensation Board.

Dr. C. M. Strong then addressed the meeting and requested that the recommendations made by the Committee appointed by the Manitoba Medical Executive to deal with this matter should be read at this meeting.

The Secretary then read the minutes pertaining to this subject.

Following further lengthy discussion, Dr. Burns assured Dr. Strong that at the next meeting of the Executive in which the Retiring Executive turned over office to the newly elected Executive, that this matter would be dealt with fully. This was accepted by Dr. Strong.

New Business.

Dr. Gordon Chown then addressed the meeting and requested that the incoming Executive go into the details of the cost of the operation of the milk depot and school medical services. He stated that this was an annual complaint and that he would like the matter dealt with thoroughly.

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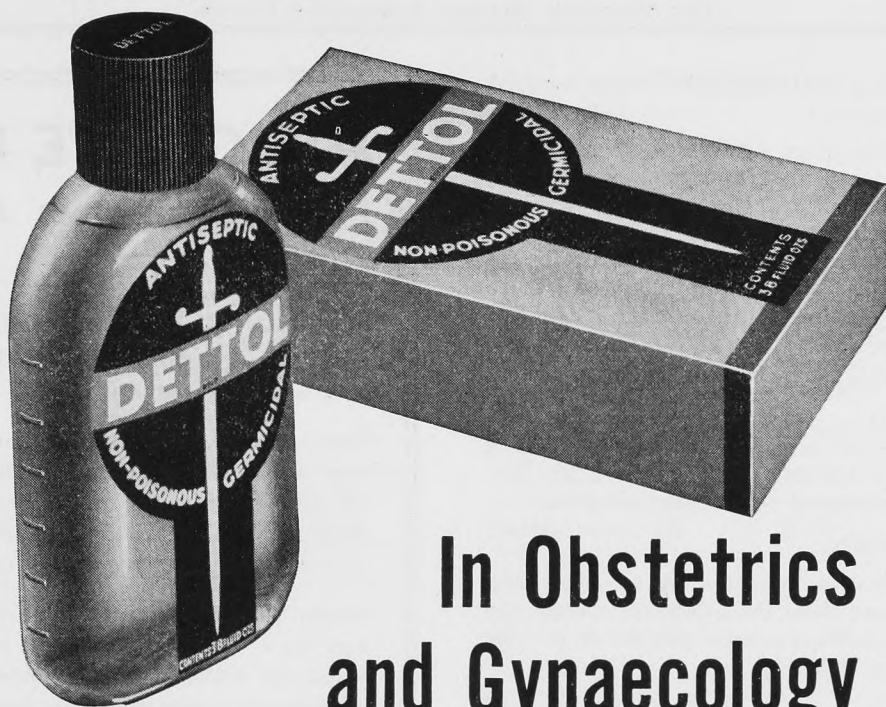
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NEWS ITEMS

TUBERCULIN TESTS IN CHILDHOOD

The following is an article published in the Publication "Preventive Medicine" by Doctor Edith M. Lincoln entitled "Tuberculin Tests in Childhood":—

"Tuberculin testing is increasing in importance year by year. When Von Pirquet in 1907 described the cutaneous test it was hailed as a great advance in diagnostic procedure. But the limitation of its usefulness was almost immediately demonstrated by reports such as that published by Hamburger and Monti in 1909 showing that 94% of adolescent Viennese children reacted positively to the test. In later years, due largely to our increasing appreciation of the infectious nature of tuberculosis, the percent. of our child population infected with tuberculosis has fallen. Charles Hendee Smith's figures from the Children's Medical Service at Bellevue Hospital which were published in 1929 showed that only 7.5% of infants up to two years of age reacted to the tuberculin test and only 38.8% of children ten to twelve years old. Recent studies made at Bellevue Hospital, not yet published, show a still further drop to 5.8% of infants with positive tests and to 32.6% in the ten to twelve year age group.

"It will be readily seen that as we reduce the amount of infection in our child population the importance of the individual test as a diagnostic measure becomes enhanced.

"There are two types of tuberculin reaction tests in general use. The cutaneous or Pirquet test and the intracutaneous test—often referred to as a Mantoux test. The former test is made by scarification with a dull instrument through a small drop of tuberculin on the flexor surface of the arm which has previously been cleansed with alcohol. A control scarification is usually also made. The test is easily done and does not hurt the child but it is much less accurate than an intracutaneous test. Hamburger expressed the belief that the Pirquet test is only 40% reliable and Smith and others have confirmed this. If negative it should always be followed by a more accurate type of test.

"The intracutaneous test may be done with a dilution of Old Tuberculin (O.T.) or with the new Purified Protein Derivative of Tuberculin (P.P.D.) which has been isolated as the active principle of O.T. O.T. should be diluted with sterile saline solution so that 0.1 cc. contains the desired dose. A first dose of 0.01 mgm. is given and after at least 5 days interval, if no reaction has occurred, 0.1 mgm. is usually given—followed by 1.0 mgm. if the reaction is negative. The New York City Department of Health furnishes a very convenient package, originally put up at C. H. Smith's suggestion, which consists of a capillary tube of tuberculin and a 10 cc. vial of salt solution. When mixed this makes a solution of tuberculin 1:1000 so that 0.1 cc. equals approximately 0.1 mgm. of tuberculin. It is a simple procedure to make the other dilutions with the same outfit. Since tuberculin is thermo-stable, syringes and needles used for tuberculin should not be otherwise employed and separate needles and syringes should be kept for the various dilutions. A recent series of tests with old dilutions of tuberculin has shown that tuberculin dilutions keep well for six months and it is not necessary to make fresh dilutions oftener than once a month.

"The Purified Protein Derivative of Tuberculin which is recommended by the Committee on Medical Research of the National Tuberculosis Association is put up in sterile tubes of two strengths, containing 0.00002 and 0.05 mgm. by weight of P.P.D. When a tablet of

either strength is dissolved in 1 cc. of sterile buffered saline solution, which is provided in each package, 0.1 cc. of the resulting solution contains the recommended dosage. If the child fails to react to the smaller dose which is equivalent to 0.1 cc. of a 1/25,000 solution of O.T., the larger dose equivalent to 0.1 cc. of a 1/100 solution of O.T. should be given after the usual interval of five or more days.

"It is possible that P.P.D. will ultimately replace O.T. entirely for testing. At the present time, however, it is much more expensive, and its stability in solution has been found to be low so the National Tuberculosis Association advises discarding solutions promptly after use. Moreover there is so much variation between the size of the first and second doses that a first test which was negative because of some factor temporarily depressing allergy might easily be followed by a severe reaction to the larger dose.

"A 1.0 cc. tuberculin syringe and a 26 gauge needle of ½ inch length should be used for an intracutaneous test. The flexor surface of the arm should be cleansed with alcohol and the injection made intracutaneously so that a small bleb rises over the needle point. It is well to establish some fixed scheme for the location of the tests to insure uniformity in reading. A scheme in common use is to give the first test on the left arm about two inches below the elbow and the second test four inches below, with the third test on the right arm two inches below the elbow.

"Tests should always be read in a good light and in doubtful cases it is sometimes possible to feel the induration when it can not be well seen and there is little or no accompanying redness. This may be especially helpful in reading tuberculin tests on Negro children. Induration is a greater criterion of the positive test than redness. It should measure at least 5 (five) mm. to constitute a positive reaction. The height of the reaction is usually reached at forty-eight hours, but every positive test is still definite at seventy-two hours although it may already have decreased slightly in size and intensity. A delayed reaction is uncommon but may occur. A test completely negative at forty-eight hours may first show redness and induration at seventy-two hours (or rarely even at ninety-six hours) and go on to pigmentation. Therefore the ideal times for reading tests would be forty-eight hours and five days after the tests are done. For rapid work the next dilution could be given when the previous test is negative after five days. In dispensary practice a weekly interval for final readings and re-testing is more practical.

"Tests may be graded according to the scheme of Hetherington, McPhedran and others. An induration of 10 mm. or less constitutes a one plus reaction—10-15 mm. two plus, more than 15 mm. three plus, and a reaction with necrosis in addition to induration or one associated with a general reaction, four plus.

"False positive reactions usually show only redness which may be very marked but may occasionally show slight induration. They usually reach their height very early and are definitely fading at forty-eight hours. In clinics where large numbers of tuberculin tests are constantly being read few doubtful reactions are seen. Where the tester is not very experienced the practice of running up the dosage in doubtful cases often clarifies the results as a weak positive will give a more definite one with a stronger dilution. Where all three dilutions of O.T. give the same equivocal reactions, testing with P.P.D. will solve the nature of most of these reactions, which are due to impurities in the tuberculin. Occasionally P.P.D. will give the same doubtful reactions as O.T., usually it gives a decided negative result where the response to O.T. is uncertain and only very rarely does it give a positive reaction when the reaction to O.T. is doubtful. If the same weak

response is obtained with all dosages of O.T. and P.P.D. it can usually be assumed that we are not dealing with a response to Tuberculin.

"Innumerable attempts have been made by investigators to prove correlations between the degree of the response to tuberculin and the type or site of the disease, the activity of the lesion or the ultimate prognosis. No definite proof has ever been advanced that such attempts can be successful and in a recent study at Bellevue Hospital we could only add our negative findings in further corroboration of this fact. There were only two factors found which varied directly with the size and intensity of the tuberculin reaction: the amount of tuberculin injected, and the age of the individual tested.

"There is a definite relationship between the amount of tuberculin injected and the size and intensity of the reaction, and the tendency for the tuberculin reaction to become more intense as the child grows older is shown definitely with all dilutions.

"It is customary to warn physicians that cases with tuberculosis of the nodes or bones should receive very small initial dosage of tuberculin as the first test. Sometimes tuberculosis of the eyes or serous surfaces are also mentioned. A careful study of our own material at Bellevue Hospital has so far failed to substantiate this idea. It is important however to remember that the older the child the greater the local response to tuberculin. It is in the adolescent groups particularly that care should be taken never to begin testing with more than 1/100 mgm. of O.T. and a smaller dosage or 1/1000 mgm. would be preferable in many cases. It is in this group particularly that the general and focal reactions may occur. These are occasionally seen during childhood but are practically never seen in infancy.

"A positive tuberculin test means only that the individual has been infected with tubercle bacilli. A negative test excludes active tuberculosis during childhood unless it is done within two weeks of recovery from measles, during high fever or when the child is in a moribund condition. By a negative test, however, we should mean a complete test ending with one mgm. of tuberculin. In ambulant children we have found that about 15% of children negative to 1/100 mgm. give positive reactions to an injection of 1/10 mgm. and a further 10% were positive to the final dose of 1 mgm. In the wards the difference was even more marked probably due to the fact that many children on the ward receive their first tests while they have fever—a factor known to depress tuberculin allergy.

"A negative tuberculin test is of great significance during childhood. Except under the above conditions we have never found it associated with active tuberculosis. Moreover while negative tuberculin tests associated with well calcified lesions apparently occur not infrequently in adults, or in late adolescence, we have seen only two such cases in a very large series of children through the age of twelve years. Moreover a tuberculin test once positive rarely becomes negative during the span of childhood especially in a child who has had definite evidence of clinical tuberculosis. In a follow up of 113 children retested after four to twelve years—111 remained positive. The two cases who became negative had no evidence of tuberculosis at any time except their positive tuberculin tests.

"It would seem reasonable to assume that since a positive tuberculin test rarely tends to become negative during childhood, that repetition of tests should not be made. Repeat tests are definitely harmful, may produce focal or general reaction and should be avoided whenever proof of a previous positive test can be obtained.

"Tuberculin is a valuable diagnostic agent. It should be used in suitable dosages and cases found to be positive should always be studied further by clinical and roentgen examination since the tuberculin test

alone can only select for us those children who have been infected by tubercle bacilli and can tell us nothing about the activity or location of the disease."

COMMUNICABLE DISEASES REPORTED

Urban and Rural - September, 1938.

Occurring in the Municipalities of:

Whooping Cough: Total 116—Unorganized 40, Arthur 15, Brandon 11, St. Boniface 10, Tuxedo 10, St. Francois 6, Kildonan East 5, Transcona 5, Winnipeg 5, Franklin 3, St. James 3, Portage City 2, Melita 1.

Scarlet Fever: Total 96—Winnipeg 35, Unorganized 10, Ritchot 9, St. Boniface 8, Portage City 6, Flin Flon 3, St. Andrews 3, Hanover 1, Kildonan East 2, Norfolk North 2, Rockwood 2, Bifrost 1, Brenda 1, Cypress North 1, Franklin 1, Kildonan North 1, La Broquerie 1, Lac du Bonnet 1, Louise 1, McDonald 1, Pilot Mound 1, Portage Rural 1, St. James 1, St. Vital 1, Transcona 1, Silver Creek 1.

Tuberculosis: Total 73—Unorganized 12, Hanover 8, Winnipeg 8, Dauphin Town 5, St. Boniface 4, St. Andrews 3, Rhineland 3, Miniota 2, Ste. Rose Rural 2, St. Vital 2, Blanchard 1, Charleswood 1, Cypress South 1, De Salaberry 1, Ethelbert 1, Flin Flon 1, Franklin 1, Gimli Village 1, Glenwood 1, Kildonan East 1, Kildonan West 1, Lawrence 1, McCreary 1, Mossey River 1, Neepawa 1, Ochre River 1, Pipestone 1, Portage City 1, Ritchot 1, Strathcona 1, Ste. Anne 1, Wallace 1, Whitemouth 1, Woodlea 1.

Chickenpox: Total 54—Winnipeg 29, Shell River 6, Cypress North 5, Brandon 3, Kildonan East 3, St. James 2, Hanover 1, Lac du Bonnet 1, Selkirk 1, St. Vital 1, Whitemouth 1, Whitewater 1.

Anterior Poliomyelitis: Total 53 — Winnipeg 17, Unorganized 11, Cypress South 2, Franklin 2, Kildonan East 2, Killarney 2, Portage City 2, Birtle Rural 1, Dauphin Rural 1, Fort Garry 1, Kildonan West 1, Morden 1, Roblin Town 1, St. Boniface 1, St. James 1, St. Vital 1, Woodworth 1, Wawanesa 1 (Late Reported: August, Boissevain 1, Portage City 1, Norfolk North 1, Whitehead 1).

Mumps: Total 36—Winnipeg 26, Brandon 3, Kildonan East 2, Portage City 1, Saskatchewan 1, Strathcona 1, St. Vital 1, Woodlands 1.

Diphtheria: Total 21—Winnipeg 6, Unorganized 6, Hanover 3, Tache 2, Morris Town 1, Portage Rural 1, Rosedale 1 (Late Reported: August, Riverside 1).

Measles: Total 17—Springfield 6, Lorne 2, Turtle Mountain 2, Winnipeg 2, Brandon 1, Emerson 1, Flin Flon 1, Thompson 1, Whitehead 1.

Typhoid Fever: Total 10—Winnipeg 3, Hanover 3, De Salaberry 1, Portage City 1, Shell River 1, Ste. Anne 1.

German Measles: Total 7—Transcona 3, Saskatchewan 2, Minto 1, St. Boniface 1.

Septic Sore Throat: Total 5—Unorganized 5.

Erysipelas: Total 5—Winnipeg 3, Grandview Rural 1, St. Laurent 1.

Influenza: Total 4—Winnipeg 1 (Late Reported: May, Mossey River 1; July, Grandview Rural 1, Norfolk South 1).

Encephalitis: Total 3 — Russell Town 1, Souris 1, Victoria 1.

Lethargic Encephalitis: Total 1—Carberry 1.

Trachoma: Total 1—Sifton 1.

Venereal Disease: Total 148—Gonorrhoea 87, Syphilis 61.

DEATHS FROM ALL CAUSES IN MANITOBA

For the Month of August, 1938.

URBAN—Cancer 37, Pneumonia 11, Tuberculosis 11.

Infantile Paralysis 4, Syphilis 2, Dysentery Bacillary 1, Throat Infection 1, Typhoid Fever 1, all others under one year 14, all other causes 105, Stillbirths 17. Total 204.

RURAL—Cancer 27, Tuberculosis 17, Pneumonia 6, Influenza 2, all others under one year 38, all other causes 90, Stillbirths 9. Total 189.

INDIAN—Tuberculosis 7, Measles 2, Pneumonia 2, Cancer 1, Whooping Cough 1, all others under one year 5, all other causes 5, Stillbirths 1. Total 24.

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Syr. Scillae 90 minims
Syr. Tolu 120 minims

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